8 Watershed Recommendations

Range-wide recommendations for recovering coho salmon in California are presented in Chapter 7. While some issues and risks facing coho salmon are constant across the entire range, others are unique to an ESU. Additionally, issues and risks for coho salmon populations and their associated habitat (both current and historic) vary substantially by recovery unit watersheds. Accordingly, the Recovery Strategy emphasizes recovery recommendations and activities at various hydrologic levels.

To aid the Department in the development of the Recovery Strategy, the CRT identified issues and developed recommendations, the vast majority of which are included in the Recovery Strategy. Several recommendations were developed after the last CRT meeting, and therefore, the CRT did not have the opportunity to review these recommendations. In a few cases, the Department has modified some of the recommendations that were developed by the CRT. Implementation schedules for the SONCC and CCC Coho ESUs are provided in Chapter 9, with additional implementation for the SSPP in Chapter 10.

The recommendations were developed for two geographic levels, the HU, which generally corresponds to major watersheds or sub-regions within the range of coho salmon, and within each HU by HSA, which generally corresponds to major tributary watersheds. In a few cases recommendations are presented for the HA, a unit intermediate in scale between the HU and the HSA. In some cases where adjacent HUs have similar characteristics and issues they are presented in a combined section (e.g., Bodega and Marin Coastal HUs, and the multiple HUs tributary to San Francisco Bay).

Recommendation numbers presented below were used during CRT discussions. They are presented here only as unique identifiers for reference to individual recommendations and to maintain a permanent record of the CRT process.

8.1 SOUTHERN OREGON/NORTHERN CALIFORNIA COASTS ESU

Recommendations for the SONCC Coho ESU in California are presented in this section.

8.1.1 ROGUE RIVER AND WINCHUCK RIVER HYDROLOGIC UNITS

8.1.1.1 Illinois River HSA

RO-IR-01	Develop a long-term plan to promote retention of LWD.
RO-IR-02	Support continued control of sediment.
RO-IR-03	Monitor impacts of suction dredge activities for deleterious affects on coho salmon, taking corrective measures when needed.
RO-IR-04	Develop a cooperative management strategy with Oregon Department Fish and Wildlife to improve downstream habitat conditions.

8.1.1.2 Winchuck River Hydrologic Unit/Winchuck River HSA

WR-SF-01 Develop a short-term plan to increase LWD until natural recruitment can be restored.

WR-SF-02 Develop a long-term plan to restore a mature coniferous riparian zone to South Fork Winchuck River.

WR-SF-03 Support the assessment, prioritization, and treatment of sources of sediment.

8.1.2 SMITH RIVER HYDROLOGIC UNIT

SR-HU-01 Develop and implement a program to control exotic vegetation, particularly canary grass, which impedes access to and use of tributaries by coho salmon.

SR-HU-02 Assess, prioritize and treat barriers to passage and other impediments to use (including water diversion), especially those blocking access to and use of smaller tributaries, including Cedar, Clarks, Morrison, Peacock, Sultan and Little Mill creeks.

SR-HU-03 Develop and implement a plan to restore the effectiveness and use of off-channel areas, sloughs, and wetlands. Yontocket, Tillas and Tryon sloughs should be given immediate attention. Since a portion of Yontocket Slough is State property, the restoration of connectivity and functionality of this slough should be given priority.

SR-HU-04 Investigate the feasibility of restoring channelized reaches of streams to natural meander belts (e.g., Lower Rowdy and Dominie creeks) that would allow recruitment of stored spawning gravel, re-establish scour pools, recruit woody debris from banks, and ultimately restore fluvial processes that maintain coho salmon habitat.

SR-HU-05 Improve the quality and quantity of deep pools, spawning gravels, and cover by measures to:

a. Protect existing LWD recruitment potential through the retention of mature coniferous trees in the riparian zone;
b. Establish adequate streamside buffer areas that are protected from vegetation removal;
c. Increase the amount of in-channel LWD;
d. Continue to review THPs; and
e. Continue riparian management projects with ranchers.

SR-HU-06 Assess the impacts of steelhead outplanting by the Rowdy Creek Hatchery.

SR-HU-07 Adequately treat legacy sources of sediment and provide for minimization of new sediment input.

SR-HU-08 Support the use of the existing watershed coordinator to aid in implementing recommendations.

8.1.2.1 Mill Creek HSA

SR-MC-01 Assess, prioritize, and treat sediment sources (mostly legacy roads).

SR-MC-02 Develop and implement a short-term plan to add LWD and a long-term plan to promote recruitment of LWD.

SR-MC-03 Develop and implement a revegetation plan for the riparian zone that includes planting of coniferous species, along with the release of conifers from competitors, such as alders and blackberries.

8.1.2.2 Wilson Creek HSA

SR-WC-01 Work with landowners to determine the amount of LWD necessary for improved flushing, pooling and habitat conditions for coho salmon, facilitate immediate placement, and develop a plan for long-term recruitment.

SR-WC-02 Develop a plan to increase connectivity of riparian habitat through fencing and planting.

SR-WC-03 Support the assessment, prioritization, and treatment of sources of sediment.

8.1.2.3 Smith River Plain HSA

SR-PL-01P Support the assessment, prioritization, and treatment of barriers to passage.

8.1.3 KLAMATH RIVER HYDROLOGIC UNIT[1]

KR-HU-01 Facilitate development of an adaptive management plan in preparation for low-flow emergencies in cooperation with the USBR, NOAA Fisheries, the USFWS, the Department of the Interior (DOI), tribes, the SWQCB and other stakeholders.

KR-HU-03 Develop a plan to restore and maintain tributary and mainstem habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage.

KR-HU-04 Develop a plan, including a feasibility analysis, for coho salmon passage over and above Iron Gate and Copco dams to restore access to historic habitat.

KR-HU-07 Analyze the feasibility and appropriateness of site-specific 2084 authorization for sport fishing for hatchery coho salmon.

KR-HU-08 Complete comprehensive flow study activities (e.g., Hardy Phase II), and use them to educate water managers on how to reduce impacts to coho salmon.

KR-HU-09 Apply protective down-ramp rates at Iron Gate Dam to minimize stranding of coho salmon fry.

KR-HU-10 Support efforts to improve quality of water entering the Klamath River mainstem from the upper Klamath River basin.

KR-HU-11 Perform cost/benefit analysis of full or partial hydroelectric project removal for the purposes of improving water quality, coho salmon passage, and sediment transport.

KR-HU-13 Ensure that uplands in key cold-water tributaries are managed in a way that preserves their cold-water thermal regime.

[1] Recommendations for Klamath River HU do not include the Salmon River HA, Shasta Valley HA, Scott River HA, or the Trinity River HU, all of which are listed below.

KR-HU-14 Investigate coho salmon non-natal rearing and refugia use in lower reaches of tributaries and mainstem confluences. Protect and enhance tributary reaches identified as providing refugia to coho salmon juveniles.

KR-HU-15 Address water quality and quantity problems in Klamath River tributaries that exacerbate mainstem water quality problems.

KR-HU-16 Assess hatchery operations in terms of coho salmon recovery in accordance with the policies and guidelines included in this recovery strategy.

KR-HU-17 Continue disease monitoring of juvenile coho salmon emigration in the Klamath River mainstem so that major disease outbreaks can be identified and their causes evaluated.

KR-HU-18 Conduct disease monitoring of migrating adult Chinook and coho salmon during fall migration.

KR-HU-19 Conduct studies in and around the Klamath River Hydroelectric Project to see if the project is contributing to habitat for the ceratomyxosis intermediate host.

KR-HU-20 Restore appropriate coarse sediment supply and transport near Iron Gate Dam. Means to achieve this could include full or partial removal of the Klamath River Project, or gravel introduction such as is done below other major dams (e.g., Trinity Dam).

KR-HU-22 Where lack of flows is a limiting factor, acquire additional water through conservation easements, purchases and/or transfers of water and water rights from willing sellers, where appropriate. Dedicate these flows to instream coho salmon needs. Water transfers would be used as an interim, emergency measure, with easements and purchases for the long-term.

KR-HU-24 Encourage water master service for all diversions by assisting with funding from the State and/or Federal government.

KR-HU-25 Promote public interest in the Klamath River Basin's coho salmon, their beneficial use and habitat requirements.

8.1.3.1 Klamath Glen HSA

KR-KG-01 Support the continuation of long-term estuary investigations to better understand the estuary's role in the survival of Klamath River basin coho salmon.

KR-KG-02 Develop a plan to restore off-channel estuarine, wetland, and slough habitat in lower Hunter and Salt creeks:

a. Determining if key properties, conservation easements, or development rights should be purchased from willing sellers; and

b. Encouraging the installation of livestock exclusion fencing to protect restored areas.

KR-KG-03 Develop a plan to maintain Blue Creek watershed tributaries as key thermal refugia and for their cool water contributions to the mainstem Klamath River. The plan should emphasize that:

a. Sediments from upslope activities do not impact the refugia;
b. Upslope stabilization and restoration activities (including road assessment and treatment) continue;
c. In-channel and riparian restoration efforts (target riparian retention efforts) continue; and
d. Feral cattle are removed.

KR-KG-04 Finalize and implement the Lower Klamath Sub-Basin Watershed Restoration Plan (Dale and Randolph 2000) to protect and restore Klamath River mainstem tributaries, even those that do not support populations of coho salmon but that provide cool water and which improve mainstem Klamath River water quality, particularly during warm summer months. Actions should:

a. Protect and/or restore riparian habitat;
b. Stabilize upslope areas to prevent sedimentation and aggradation at the mouth of tributaries; and
c. Work with Federal land managers to reduce impacts to riparian corridors and sediment loads.

KR-KG-05 Support actions to reduce sediment input from upslope sources, such as to:

a. Decommission roads and skid trails;
b. Upgrade roads and maintenance practices;
c. Ensure adequate coho salmon migration is provided for at stream/road crossings;
d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams; and
e. Minimize alteration of natural hill slope drainage patterns.

KR-KG-06 Review existing inventory and assessment of barriers (Gale 2003) and prioritize barriers impeding migration of adult and juvenile coho salmon throughout the Lower Klamath River tributaries.

KR-KG-06b Investigate temporal and spatial magnitude of tributary deltas and seasonal subsurface flow reaches to determine impacts to juvenile and adult coho salmon migration and to quantify seasonal loss of lower tributary habitat. Investigation should include assessment of long-term delta size trends, annual variation in coho salmon access periodicity by tributary, quantification of seasonal habitat loss and fish stranding, and the relation of delta and subsurface flow formation to upslope erosion, river and tributary flow, mainstem bed load deposition and other causative factors.

KR-KG-06c Conduct feasibility study to re-establish adult coho salmon passage above major barriers in lower Roaches and Tully creeks and the Middle and North Forks of Ah Pah Creek.

KR-KG-07 Support treating sediment sources and improving riparian and instream habitat conditions to provide adequate and stable spawning and rearing areas for coho salmon.

KR-KG-08 Develop a plan to restore in-channel and riparian habitat in tributaries:

a. Revegetate riparian zones with native species (e.g., conifers) to stabilize stream banks and promote a long-term supply of LWD;

b. Provide adequate protection from development, grazing, etc. for riparian areas; and

c. Relocate roads out of riparian areas where feasible.

KR-KG-09 Develop a plan to provide suitable accumulations of woody cover in slow-velocity habitats for coho salmon winter rearing on a short-term basis by placing wood in needed areas until natural supplies become available.

KR-KG-10a Construct livestock exclusionary fencing and corresponding riparian restoration as necessary in Salt, lower High Prairie, lower Hunter and lower Terwer creeks. Provide funding and incentives to landowners and/or restoration groups where necessary to achieve this goal.

KR-KG-10b Develop a plan to remove feral cattle from lower Blue and Bear creeks.

KR-KG-11a Work with Humboldt County, NOAA Fisheries and existing and future gravel-mining operators to restrict gravel-mining operations to appropriate mainstem Klamath River locations. Gravel mining should not be conducted within lower Klamath River tributary watersheds until a scientifically valid and peer-reviewed geomorphic analysis is conducted to determine existing channel stability, causes of excess aggradation, and identifies gravel mining as an appropriate restorative measure, as outlined in task RW-XXXV-A-1. (See Table 9-1).

KR-KG-12 Encourage cooperation between industrial timber land managers and the tribes to restore coho salmon habitat. Use the successful Tribal/Simpson Resource Company program as an example.

KR-KG-13 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, such as technical support.

KR-KG-14 Provide technical and financial support to implement riparian restoration throughout alluvial reaches in lower Blue, Terwer, Hunter and Salt creeks.

KR-KG-15 Investigate straying and impacts of exotic fish (e.g., bass and bullhead) populations in an abandoned mill pond in lower Richardson Creek to coho salmon in the adjoining Klamath River estuary.

KR-KG-17 Continue funding and technical support for the California Conservation Corps Del Norte Center to continue their collaborative participation with the Yurok Tribe and Simpson Resource Company to implement watershed restoration throughout the lower Klamath River subbasin.

KR-KG-18 Support continued implementation of the Coho Salmon Regional Abundance Inventory throughout the lower Klamath River subbasin.

KR-KG-19 Develop a plan to restore the historic flood plain on Hoppaw Creek, in cooperation with landowners and Caltrans.

8.1.3.2 Orleans HSA

KR-OR-01 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon that provide cool water and which improve mainstem Klamath River water quality and which provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Include improved land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads where feasible.

KR-OR-02 Support activities to maintain connectivity (i.e., flow) between mainstem habitat and tributary habitat in Slate and Red Cap creeks.

KR-OR-03 Develop a plan to protect and enhance spawning and rearing habitats in Boise and Camp creeks.

KR-OR-04 Develop a plan to protect and enhance Bluff and Red Cap Creek watersheds, which are classified as *Key Watersheds* in the Northwest Forest Plan, and are biological refugia for coho salmon. Key watersheds serve as biological refugia for maintaining and recovering habitat for stocks of anadromous fish at risk, such as coho salmon.

KR-OR-05 Re-establish natural fire regimes consistent with the Northwest Forest Plan to reduce the risk and impact of large, severe fire on coho salmon.

KR-OR-06 Support efforts to provide livestock exclusion fencing where feasible and appropriate, while providing off-site watering.

KR-OR-07 Support actions to reduce sediment input from upslope sources, including measures to:

a. Decommission roads and skid trails;

b. Upgrade roads and maintenance practices;

c. Ensure adequate coho salmon migration is provided for at stream/road crossings;

d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams; and

e. Minimize alteration of natural hill slope drainage patterns.

8.1.3.3 Ukonom HSA

KR-UK-01 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Include improved land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads where feasible.

KR-UK-02 Support actions to reduce sediment input from upslope sources, including measures to:

a. Decommission roads and skid trails;

b. Upgrade roads and maintenance practices;

c. Ensure adequate coho salmon migration is provided for at stream/road crossings;

d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams; and

e. Minimize alteration of natural hill slope drainage patterns.

KR-UK-03 Develop a plan to restore and maintain tributary and mainstem habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage. Implement highest priority barrier repairs as identified in the Caltrans inventory. USFS and the Karuk Tribe have identified culverts on Highway 96 at Stanshaw, Sandy Bar, and Coon creeks as needing treatment.

KR-UK-04 Develop a plan to ensure continued yields of high quality water and the maintenance the ecological function of tributary riparian systems, including measures to:

a. Conduct riparian revegetation and stream-bank restoration;

b. Encourage, where feasible, the relocation of roads out of riparian areas and off of unstable land features (e.g., active landslides, granitic terrain, toe zones, wet-seepy areas);

c. Increase the number of conifers and deciduous trees, where appropriate, for more stable stream banks, stream shading, and eventual recruitment of LWD; and

d. Revegetate flood plain areas using native species.

KR-UK-05 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, such as technical support.

KR-UK-06 Re-establish natural fire regimes consistent with the Northwest Forest Plan to reduce the risk and impact of large, severe fire on coho salmon.

KR-UK-07 Where necessary, provide riparian protection from livestock through exclusion fencing while providing off-site watering.

KR-UK-08 Encourage installation of screens on diversions to Department-NOAA Fisheries standards. Provide funding incentives to landowners where necessary to achieve this goal.

KR-UK-09 Improve water diversion and delivery system efficiency.

KR-UK-10 Continue restoration and monitoring of Siskon Mine to prevent further degradation of the riparian resource.

KR-UK-11 Request that the SWRCB to investigate diversions and use of water on Stanshaw Creek.

8.1.3.4 Happy Camp HSA

KR-HC-01 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Improve land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads where feasible.

KR-HC-02 Support actions to reduce sediment input from upslope sources, including measures to:

a. Decommission roads and skid trails;

b. Upgrade roads and maintenance practices;

c. Ensure adequate coho salmon migration is provided for at stream/road crossings;

d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams; and

e. Minimize alteration of natural hill slope drainage patterns.

KR-HC-03 Develop a plan to improve coho salmon passage at stream and road crossings, including measures to:

a. Replace culverts on both the USFS and Caltrans roads with structures allowing coho salmon passage. The USFS and Karuk Tribe have identified culverts under Highway 96 at Cade, Portuguese, and Fort Goff creeks as needing treatment;

b. Prioritize and upgrade crossings to accommodate 100-year storm flows and associated bedload and debris; and

c. Encourage the USFS, County and State agencies to provide adequate budgets basin-wide for road maintenance and upgrades.

KR-HC-04 Develop a plan to ensure continued yields of high quality water and maintenance the ecological function of tributary riparian systems, including measures to:

a. Conduct riparian revegetation and stream-bank restoration;

b. Encourage, where feasible, the relocation of roads out of riparian areas and off of unstable land features (e.g., active landslides, granitic terrain, toe zones, wet-seepy areas);

c. Increase the number of conifers and deciduous trees, where appropriate, for more stable stream banks, stream shading, and eventual recruitment of LWD; and

d. Revegetate flood plain areas using native species.

KR-HC-05 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, such as technical support.

KR-HC-06 Re-establish natural fire regimes consistent with the Northwest Forest Plan to reduce the risk and impact of large, severe fire on coho salmon.

KR-HC-07 Where necessary, provide riparian protection from livestock through exclusion fencing while providing off-site watering.

KR-HC-08 Encourage installation of screens on diversions to Department-NOAA Fisheries standards. Provide funding incentives to landowners where necessary to achieve this goal.

KR-HC-09 Increase water diversion and delivery system efficiency where feasible and appropriate. Provide funding and incentives to landowners where necessary to meet this goal.

KR-HC-10 Encourage the NCRWQCB to continue monitoring Grey Eagle Mine and tailings as a follow-up to remediation that has already been done. Encourage EPA Region 9 to consider coho salmon when dealing with both emergency and remedial actions.

8.1.3.5 Seiad Valley HSA

KR-SV-01 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Improve land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads where feasible.

KR-SV-02 Support actions to reduce sediment input from upslope sources:

a. Decommission roads and skid trails;

b. Upgrade roads and maintenance practices;

c. Ensure adequate coho salmon migration is provided for at stream/road crossings;

d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams; and

e. Minimize alteration of natural hill slope drainage patterns.

KR-SV-03 Support efforts to improve coho salmon passage at stream and road crossings, including measures to:

a. Replace culverts on both the USFS and Caltrans roads with structures allowing coho salmon passage;

b. Treat coho salmon passage problems associated with the USFS roads;

c. Prioritize and upgrade crossings to accommodate 100-year storm flows and associated bedload and debris; and

d. Encourage the USFS, County, and State agencies to provide adequate budgets basin-wide for road maintenance and upgrades.

KR-SV-04 Develop a plan to ensure continued yields of high quality water and to maintain the ecological function of tributary riparian systems, including measures to:

a. Conduct riparian revegetation and stream-bank restoration;

b. Encourage the relocation of roads out of riparian areas and off of unstable land features (e.g., active landslides, granitic terrain, toe zones, wet-seepy areas);

c. Increase the number of conifers and deciduous trees, where appropriate, for more stable stream banks, stream shading, and eventual recruitment of LWD; and

d. Revegetate flood plain areas using native species.

KR-SV-05 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, such as technical support.

KR-SV-06 Manage roadless areas within the Seiad Valley HSA to be consistent with land use allocations under the Northwest Forest Plan to reduce the risk of large, severe fires by re-establishing the natural fire regimes.

KR-SV-07 Where necessary, provide riparian protection from livestock through exclusion fencing while providing off-site watering.

KR-SV-08 Encourage installation of screens on diversions to Department-NOAA Fisheries standards. Provide funding incentives to landowners where necessary to achieve this goal.

KR-SV-09 Study the likely benefits to instream flow of increasing the efficiency of water diversions and delivery systems where feasible and appropriate. Provide funding and incentives to landowners where necessary to meet actions that are given a high priority.

KR-SV-10 Identify illegal water diverters; request that the SWRCB take appropriate action and review and/or modify water use based on the needs of coho salmon and authorized diverters.

KR-SV-11 Look for opportunities to acquire water rights for instream flow from willing participants who possess valid water rights.

KR-SV-12 Assess potential coho salmon passage problem associated with private water diversion at the mouth of Middle Creek (tributary to Horse Creek). If problem exists, design and implement remediation project.

8.1.3.6 Beaver Creek HSA

KR-BC-01 Re-establish natural fire regimes consistent with the Northwest Forest Plan to reduce the risk and impact of large, severe fire on coho salmon.

KR-BC-02 Encourage landowners to manage fuels to prevent large, severe fires and to evaluate the application of the Watershed Evaluation Mitigation Addendum.

KR-BC-03 Assess fine sediment production and delivery from the USFS road adjacent to the West Fork of Beaver Creek and implement appropriate remediation.

KR-BC-04 Hydrologically disconnect the USFS Beaver Creek road, north of West Beaver Creek.

KR-BC-05 Support actions to reduce sediment from upslope sources:

a. Decommission roads and skid trails;

b. Upgrade roads and maintenance practices;

c. Ensure adequate coho salmon migration is provided for at stream/road crossings;

d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams;

e. Minimize alteration of natural hill slope drainage patterns; and

f. Encourage the relocation of roads out of riparian areas and off of unstable land features (e.g., active landslides, granitic terrain, toe zones, wet-seepy areas).

KR-BC-06 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Improve land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads where feasible.

KR-BC-07 Implement the plan to protect and restore tributaries, even those that do not support populations of coho salmon that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months.

KR-BC-08 Improve coho salmon passage at stream and road crossings, by measures to:

a. Replace culverts on both the USFS and Caltrans roads with structures allowing coho salmon passage;

b. Treat coho salmon passage problems associated with the USFS roads;

c. Prioritize and upgrade crossings to accommodate 100-year storm flows and associated bedload and debris; and

d. Encourage the USFS, County, and State agencies to provide adequate budgets basin-wide for road maintenance and upgrades.

KR-BC-09 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment; and

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors.

KR-BC-10 Provide technical support as an incentive to landowners for ongoing efforts of restoring LWD and shade to the watershed.

KR-BC-11 Where necessary, provide riparian protection from livestock while providing off-site watering.

8.1.3.7 Hornbrook HSA

KR-HB-01 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Improve land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads where feasible.

KR-HB-02 Implement the plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months.

KR-HB-03 Improve coho salmon passage at stream and road crossings, including measures to:

a. Replace culverts on both the USFS and Caltrans roads with structures allowing coho salmon passage;

b. Treat coho salmon passage problems associated with the USFS roads; and

c. Encourage the USFS, County, and State agencies to provide adequate budgets basin-wide for road maintenance and upgrades.

KR-HB-05 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, including technical support.

KR-HB-09 Study the likely benefits to instream flow of increasing the efficiency of water diversions and delivery systems where feasible and appropriate. Provide funding and incentives to landowners where necessary to meet actions that are given a high priority.

KR-HB-10 Identify water diverters; request that the SWRCB review and/or modify water use based on the needs of coho salmon and authorized diverters.

KR-HB-11 Look for opportunities to acquire water rights for instream flow from willing participants who possess valid water rights.

8.1.3.8 Iron Gate HSA

KR-IG-01 Develop a plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months. The plan should:

a. Improve land management to reduce impacts to riparian corridors, reduce sediment loads, and protect water resources;

b. Request that the SWRCB review existing water appropriations for compliance;

c. Petition the SWRCB to designate streams with critical summer flows as fully appropriated streams during the appropriate period; and

d. Provide measures that reduce hydrologic connectivity between streams and roads, where feasible.

KR-IG-02 Implement the plan to protect and restore tributaries, even those that do not support populations of coho salmon, that provide cool water, improve mainstem Klamath River water quality, and provide thermal refugia for coho salmon, particularly during warm summer months.

KR-IG-03 Improve coho salmon passage at stream and road crossings, including measures to:

a. Prioritize and upgrade crossings to accommodate 100-year storm flows and associated bedload and debris;

b. Treat coho salmon passage problems associated with the USFS roads; and

c. Encourage the USFS, County, and State agencies to provide adequate budgets basin-wide for road maintenance and upgrades.

KR-IG-05 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, including technical support.

KR-IG-09 Study the likely benefits to instream flow of increasing the efficiency of water diversions and delivery systems where feasible and appropriate. Provide funding and incentives to landowners where necessary to meet actions that are given a high priority.

KR-IG-10 Identify water diverters; request that the SWRCB review and/or modify water use based on the needs of coho salmon and authorized diverters.

KR-IG-11 Look for opportunities to acquire water rights for instream flow from willing participants who possess valid water rights.

8.1.4 SALMON RIVER HYDROLOGIC AREA

SA-HA-01 With the goal of reducing sediment and providing coho salmon passage at all life history stages where roads affect coho salmon habitat:

a. Implement Forest Roads Analysis, private and county roads assessment recommendations;

b. Complete road sediment source inventory on all roads within the Salmon River HSA; and

c. Correct identified passage barriers on all roads.

SA-HA-02 Foster the multi-agency task force to identify and prioritize barrier to fish passage and implement corrective treatments. This task force would include at a minimum, representatives from Salmon River Restoration Council, Karuk Tribe, the USFS, NOAA Fisheries, the USFWS, and the Department.

SA-HA-03 Educate landowners, restoration specialists, and watershed restoration groups to reduce the impacts of private roads on coho salmon.

SA-HA-04 Encourage collaborative efforts among agencies and stakeholders to control or remove invasive exotics using integrated pest management techniques.

SA-HA-05 Reduce the risk of large, severe fires through fuels management around residential structures, homes, and escape routes. Implement Salmon River Fire Safe Council recommendations promoting the reduction of fuel near residences to reduce human-caused fires spreading into the forest and causing harm to coho salmon habitat.

SA-HA-06 Re-establish fire regimes consistent with Northwest Forest Plan objectives to reduce the risk and impact of large, severe fire on coho salmon.

SA-HA-09 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade, primarily in tributaries and key refugia areas, through:

a. LWD placement;

b. Management to promote conifer recruitment;

d. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

e. Incentives to landowners, such as technical support.

SA-HA-10 Develop a plan to prioritize and remediate mine tailings.

8.1.4.1 Lower Salmon River HSA

SA-LS-01 Restore and maintain habitat connectivity between the Salmon River and Nordheimer Creek where low flow or sediment aggradation has been known to restrict coho salmon passage.

SA-LS-02 Support ongoing maintenance and operations for the Nordheimer Creek Fish Ladder.

8.1.4.2 Sawyers Bar HSA

SA-SB-01 Reduce current and future sediment inputs to Specimen Creek, North Russian and South Russian creeks by the following actions:

a. Upgrade, improve, maintain, and/or storm proof (out sloping roads, reducing hydrologic connectivity) roads;

b. Stabilize slopes where feasible;

c. Reduce or avoid alteration of natural hill slope drainage patterns; and

d. Upgrade stream/road crossings and ensure coho salmon passage.

SA-SB-02 Conduct riparian revegetation and stream-bank stabilization along entire North Fork by the following actions:

a. Control vegetation removal in the streamside zone;

b. Increase the number of conifers and deciduous trees to provide stable stream shading and which will eventually become a source for LWD; and

c. Revegetate flood plain areas using native species.

8.1.5 SHASTA VALLEY AND SCOTT RIVER HYDROLOGIC AREAS

SS-HA-01 Reduce the risk of large, severe fires through fuels management (especially in the Scott) around residential structures and homes. Implement Fire Safe Council recommendations promoting the reduction of fuel near residences to reduce human-caused fires spreading into the forest and causing harm to coho salmon habitat.

SS-HA-02 Support actions to reduce human-caused sediment input from upslope sources identified through public and private inventories. Prioritize remediation activities, which would include slope stabilization, minimizing sediment production, and eliminating coho salmon passage barriers.

SS-HA-03 Encourage Federal, State, and county agencies and private landowners to reduce impacts to coho salmon habitat from public and private road systems. Continue road and/or watershed assessments to identify and prioritize sources and risks of road-related sediment delivery to watercourses. Support activities to:

a. Reduce road densities where necessary and appropriate;

b. Upgrade roads and road maintenance practices to eliminate or reduce the potential for concentrating run-off to streams during rainfall events. Employ best available technology when appropriate;

c. Decrease potential for stream flow to become diverted at road crossings during high flow events resulting in flow along the road that returns to the channel at undesirable locations;

d. Stabilize slopes to minimize or prevent erosion and to minimize future risk of eroded material entering streams;

e. Minimize alteration of natural hill slope drainage patterns; and

f. Encourage funding authorities to allocate adequate budgets to Federal, State, and local agencies and private landowners for road maintenance activities, capital project activities, and dedicated funding to pay for coho salmon passage projects.

SS-HA-04 Encourage funding authorities to allocate adequate resources to prioritize and upgrade crossings to provide coho salmon passage within the range of coho salmon to pass 100-year flows and the expected debris loads (e.g., LWD that might be mobilized).

SS-HA-05 Identify barriers to passage and prioritize them for removal, through collaborative efforts with other agencies' needs.

SS-HA-06 Design and implement a reclamation plan to remediate effects of historical mining (i.e., tailings near Callahan) with the goal of enhancing the production and survival of coho salmon. Identify locations, costs, and restoration potential of intensively mined areas. (Carry out the same kind of planning for Trinity River and Indian Creek.)

SS-HA-07 Improve water quality by reducing or minimizing both domestic and municipal sources of nutrient input (i.e., sewage treatment plant discharge and storm drain runoff). Support efforts by cities and rural communities to complete system upgrades to achieve CWA compliance.

SS-HA-08 Minimize impacts of cattle grazing on watercourses through exclusionary fencing as necessary and appropriate (i.e., providing off-site watering, preventing overgrazing, etc.).

SS-HA-09 Support cooperative State and local efforts to redirect Big Mill Creek into its historic channel under State Route 3, thereby restoring adult and juvenile coho salmon access to approximately 1.25 miles of quality spawning and rearing habitat.

SS-HA-10 Assess the potential benefits and technical feasibility of increasing stream flows in the Scott River for fish and wildlife within the Klamath National Forest. This should be dealt with during the verification described in SSRT water management recommendations.

SS-HA-11 Request the USBR to study the potential benefits of adjusting Iron Gate flows to better meet the needs of adult and juvenile life stages to enhance Scott/Shasta coho salmon production, consistent with the flow needs of the Klamath and Trinity rivers.

SS-HA-18 Support ongoing watershed planning and complete comprehensive, peer-reviewed watershed restoration plans for the Shasta and Scott rivers that include identification and prioritization of all restorative needs in each basin. When restoration funds are limited, implementation should occur on the highest priority issues most likely to effectively address coho salmon needs within each basin.

SS-HA-24 Investigate incentive-based alternatives with willing participants for preserving water quality, quantity and coho salmon habitat in the Big Springs area in the Shasta River.

SS-HA-25 Maintain and revegetate, where appropriate, riparian trees in headwaters and along creeks that provide shade habitat essential for coho salmon.

SS-HA-26 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement; and

b. Management to promote conifer recruitment.

8.1.6 TRINITY RIVER HYDROLOGIC UNIT

TR-HU-01 Implement the Trinity River Record of Decision (ROD), which would provide:

a. Variable annual instream flows for the Trinity River from the Trinity River Dam (TRD) based on forecasted hydrology for the Trinity River Basin as of April 1st of each year, ranging from 369,000 acre-feet (af) in critically dry years to 815,000 af in extremely wet years;

b. Physical channel rehabilitation, including the removal of riparian berms and the establishment of side-channel habitat;

c. Sediment management, including the supplementation of spawning gravels below the TRD and reduction in fine sediments which degrade coho salmon habitat;

d. Watershed restoration efforts, addressing negative impacts which have resulted from land use practices in the basin; and

e. Infrastructure improvements or modifications, including rebuilding or fortifying bridges and addressing other structures affected by the peak instream flows provided by the ROD.

TR-HU-02 Recommend to the NCRWQCB that the TMDL process consider alterations in the sediment load allocations and targets due to implementation of the ROD.

TR-HU-06 Recommend that the USBR implement the Trinity River TMDL instream flushing flows without affecting ROD allocations.

TR-HU-07 Encourage the NCRWQCB to establish TMDL implementation plans for the Main Stem and South Fork using the upslope indicators and targets established in the Mainstem Load Allocation.

TR-HU-08 Support development of a County grading ordinance based on exemption, certification, and permitting criteria.

TR-HU-09 Encourage Trinity County to implement the Five Counties *Water Quality and Stream Habitat Protection Manual for County Road Maintenance* in Northwestern California Watersheds.

TR-HU-10 Support continued State and Federal funding for the implementation of sediment reduction programs for private lands and the implementation of DIRT-prioritized sediment source sites treatment funding on County roads.

TR-HU-11 Encourage Trinity County to establish incentives and standards for private riparian and wetlands area protection based on flexible subdivision design; road, curb and gutter requirements; minimum lot size and density; clustering and other techniques.

TR-HU-12 Encourage Trinity County to establish riparian setbacks for grading activities on private lands, based on the Department's 1994 recommendations to District I counties.

TR-HU-13 Evaluate the impacts of non-native fish species on coho salmon and develop management guidelines to reduce impacts.

TR-HU-14 Encourage Trinity County to develop or amend existing County Conservation, Open Space and Land Use Elements and Community plans to focus development away from riparian habitats, wetland habitats, or steep slopes. Consider all species habitats, wildland-urban fire hazard and other land uses factors in making allocations.

TR-HU-15 Analyze the feasibility and appropriateness of site-specific §2084 authorization for sport fishing for hatchery coho salmon.

8.1.6.1 Douglas City HSA

TR-DC-01 Evaluate water diversions on Reading, Indian, and Browns creeks. Restore coho salmon passage and encourage instillation of screens to Department-NOAA Fisheries standards. Provide incentives to landowners when necessary to reach this goal.

TR-DC-02 Increase riparian function in lower Reading, Indian, and Browns creeks with conservation easements or landowner incentives that reduce agricultural and grazing impacts.

TR-DC-03 Implement sediment reduction plans consistent with County plans and policies.

8.1.6.2 Grouse Creek HSA

TR-GC-01 Support continued implementation of habitat restoration, including measures to stabilize upslope areas, enhance riparian zones, storm proof, stabilize, and/or decommission roads, and replace culverts.

8.1.6.3 Hyampom HSA

TR-HY-01 Request that the USFS develop a management plan for Big Slide to reduce human contributions to mobilization of sediments, including evaluating relocation of the county road that crosses Big Slide.

TR-HY-02 Request that the USFS reduce fuel loading in stands that could be susceptible to large, severe fire. Where appropriate, this management should include actions to accelerate the growth of conifers for LWD recruitment, develop mature shade canopy in the riparian zone, and to provide for other multiple use goals.

TR-HY-03 Continued implementation of habitat restoration, including measures to stabilize upslope areas, enhance riparian zones, storm proof, stabilize, and/or decommission roads, and replace culverts.

8.1.6.4 Hayfork HSA

TR-HA-01 Encourage agricultural/residential water conservation programs through incentive programs.

TR-HA-02 Recommend that Trinity County amend its Critical Water Resources Overlay zone to address new riparian water rights development resulting from parcel subdivision. The amendment should include expanding the overlay zoning to additional watersheds where summer surface flows are limiting factors for residents and for coho salmon fisheries habitat.

TR-HA-03 Support continued implementation of riparian improvements through restoration activities, land use planning, and conservation easements.

TR-HA-04 Support efforts to provide livestock exclusion fencing where feasible and appropriate, while providing off-site watering.

TR-HA-05 Continue to implement habitat restoration, including measures to stabilize upslope areas, enhance riparian zones, storm proof, stabilize, and/or decommission roads, and replace culverts.

8.1.7 MAD RIVER HYDROLOGIC UNIT

MR-HU-01 Work with landowners and other entities to reduce coho salmon tributary stream temperature through the development of mature coniferous overstory within the riparian zone by continuing:

a. Planting programs in stream corridors barren of mature conifers;

b. THP review; and

c. Riparian management projects with cattle ranchers.

MR-HU-02 Recommend that the SWRCB make a high priority in this HU of the:

a. Review of authorized diversions that have no provisions to protect coho salmon; and

b. Identification of unauthorized diversions and enforcement actions to stop them.

MR-HU-03 Work with landowners and other entities to improve the quality and quantity of deep pools, spawning gravels, and cover by measures to:

a. Protect existing LWD recruitment potential through the retention of mature coniferous trees in the riparian zone;

b. Establish adequate streamside buffer areas;

c. Increase the amount of in-channel LWD;

d. Continue to review THPs; and

e. Continue riparian management projects with ranchers.

MR-HU-04 Conduct pre-project geological surveys where needed. Develop permit conditions to limit activities within unstable areas and identify mitigation measures for restoration and enhancement.

MR-HU-05 Adopt measures to protect riparian vegetation for all development over which they have jurisdiction.

MR-HU-07 Assess barriers to passage, prioritize barriers for removal, and develop a plan to treat the barriers, with Warren Creek given a high priority for treatment.

MR-HU-08 Develop a plan to restore and maintain tributary and mainstem habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage. This is a known problem at Cañon Creek, Dry Creek, and North Fork Mad River.

MR-HU-09 Consider the mouths of Cañon Creek, Dry Creek, and North Fork Mad River as locations to:

a. Identify causes of loss of connectivity;

b. Evaluate management techniques;

c. Implement the identified strategy; and

d. Address permitting complexity for identified implementation measures.

MR-HU-10 Continue stream management activities with landowners in Lower Lindsay Creek.

MR-HU-11 Develop programs to control exotic vegetation, especially canary grass.

MR-HU-12 Evaluate the impact of the Mad River Hatchery steelhead production on coho salmon.

MR-HU-13 Encourage Federal, State, and county agencies and private landowners to reduce impacts to coho salmon habitat from public and private road systems.

MR-HU-14 Continue road and watershed assessments to identify and prioritize sources and risks of road-related sediment delivery to watercourses.

MR-HU-15 Reduce road densities where necessary and appropriate.

MR-HU-16 Decrease potential for stream flow to become diverted at road crossings during high flow events, resulting in flow along the road that returns to the channel at undesirable locations.

MR-HU-17 Stabilize slopes along roadways to minimize or prevent erosion and to minimize future risk of eroded material entering streams.

MR-HU-18 Minimize alteration of natural hill slope drainage patterns to decrease erosion and sediment input into the streams.

MR-HU-19 Encourage funding authorities to allocate adequate budgets to Federal, State, and local agencies and private landowners for road maintenance activities, capital project activities, and dedicated funding to pay for coho salmon passage projects.

MR-HU-20 Encourage CHERT to incorporate coho salmon friendly measures.

8.1.7.1 Blue Lake HSA and North Fork Mad HSA

MR-BL-01 Encourage landowners, municipalities, and Tribal interests to work together to develop a watershed restoration plan.

MR-BL-02 Encourage agencies and land managers to work with qualified watershed groups. Develop and support well informed watershed communities with regards to coho salmon habitat issues. Ensure that there are adequate incentives for landowners who participate in activities to protect and/or restore coho salmon habitat and watershed processes. Implement an outreach program regarding issues of parity and obligations of stakeholder groups.

8.1.7.2 Butler Valley HSA

MR-BV-01 Reduce temperature impacts through establishment of adequate streamside buffer areas that are protected from vegetation removal; with emphasis on maintaining a significant number of large conifers within the riparian zone.

MR-BV-02 Reduce input of fine and coarse sediments into streams through priority road related sediment reduction assessment and implementation, and reducing management activities within unstable areas.

MR-BV-03 Establish access for both adult and juvenile coho salmon to suitable habitat by upgrading prioritization of culverts identified as passage barriers on both private and public lands.

8.1.8 REDWOOD CREEK HYDROLOGIC UNIT

RC-HU-01 Work with Redwood National and State parks, private landowners, and interested parties to improve coho salmon habitat conditions of the estuary while protecting Highway 101 and the Town of Orick. These plans should aim toward restoring the historic form and function of the estuary/lagoon and slough channels, riparian forests, and adjacent wetlands. This includes providing for:

a. Unconfined channels;

b. Restoration of riparian vegetation, tree cover, wetlands, and off-channel and rearing habitat;

c. Increased sediment transport, pool depth, and LWD;

d. Work to restore natural drainage patterns from adjacent wetlands; and

e. Improving the conditions of sloughs and tributaries to the estuary (Strawberry, Dorrance and Sand Cache creeks).

RC-HU-02 Work with USACE, Redwood National and State parks, and Humboldt County Planning Department to modify levee maintenance manuals to be consistent with habitat requirements of coho salmon while maintaining flood control.

RC-HU-03 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of small, suppressed conifers, and control of alders, blackberries, and other competitors (RW-XXII-A-04); and

d. Incentives to landowners, such as funding and technical support.

RC-HU-04 Encourage completion of assessments of sediment sources and upgrade deficient assessments; then encourage implementation of the recommendations contained in the assessment, paying particular attention to road assessment and implementation of road improvement projects; and the incorporation of measures to preclude sediment delivery to stream systems in near stream land use planning (especially on slopes greater than 35%).

RC-HU-05 Develop and implement measures to reduce water temperatures, improve the quality and quantity of deep pools, spawning gravels, and cover by protecting existing LWD recruitment potential through retention of mature trees in the riparian zone, establishing adequate near stream buffer areas protected from vegetation removal, and increasing the amount of in-channel LWD. Root wads should be left on LWD.

RC-HU-06 Coordinate a long-term, concerted effort between landowners, interested parties, and responsible agencies to determine the current population size and trends of coho salmon of Redwood Creek.

RC-HU-07 Conduct pre-project geological surveys where needed.

RC-HU-08 Continue to review and improve THPs with regard to protection of coho salmon and their habitat.

8.1.9 TRINIDAD HYDROLOGIC UNIT

TP-HU-01 Support the assessment, prioritization, and treatment of sediment sources, particularly roads, which have not been assessed and acknowledge progress that has been made in addressing sediment sources.

TP-HU-02 Work with Humboldt County and landowners to maintain flood plain capacity and prevent future encroachment on the flood plain.

8.1.9.1 Big Lagoon HSA

TP-BL-01 Continue to work with private landowners to develop riparian buffers with an adequate conifer component and canopy closure to reduce temperatures, increase LWD, and provide sediment filtration.

TP-BL-02 Develop a plan to restore the historic flood plain on Mill Creek (a.k.a. Pitcher Creek), in cooperation with landowners.

8.1.9.2 Little River HSA

TP-LR-01 Develop a plan to improve the functioning of the lower river estuary. Re-establish conifers and a functional flood plain and riparian zone on the lower river channel. Re-establish more complex instream habitat. The plan should include the release of conifers, exclusion fencing where necessary, and riparian planting.

TP-LR-02 Work with landowners to minimize the impacts of agricultural activities on the estuary.

TP-LR-04 Work with Humboldt County and landowners to maintain current flood plain capacity and prevent future encroachment on the flood plain.

8.1.10 EUREKA PLAIN HYDROLOGICAL UNIT

EP-HU-02 Support implementation of Humboldt County's provisions to protect Stream Management Areas and evaluate their effectiveness; recommend revisions as necessary.

EP-HU-03 Work with agencies and landowners, to re-establish estuarine function.

EP-HU-04 Acknowledge the Arcata City Sewage Treatment Project and encourage implementation of similar projects elsewhere, where possible.

EP-HU-05 Assess sources of sediment input, prioritize and implement remediation projects.

EP-HU-06a Review recent habitat surveys and identify gaps in data; conduct habitat surveys in areas identified as lacking data.

EP-HU-06b Identify and prioritize rearing habitat reaches for protection.

EP-HU-06c Improve quality and quantity of deep pools and spawning gravels.

EP-HU-06d In cooperation with willing landowners, restore and maintain historical tidal areas, backwater channels and salt marsh.

EP-HU-06e Maintain, protect and restore channel conditions important to all life stages of coho salmon (e.g., spawning gravels, pool depth, rearing gravels, food) as it relates to bed load.

EP-HU-06f Identify reaches where naturally functioning channel and flood plain conditions exist. Maintain and restore a functioning flood plain and natural channel processes where practicable.

EP-HU-06g Identify impacted reaches where a functioning flood plain could be re-established:

a. Prioritize areas that are not naturally functioning for restoration potential; and

b. Develop site specific project objectives to protect and restore naturally functioning channel and flood plain conditions where feasible.

EP-HU-06h Conduct hydrologic analysis for all Humboldt Bay tributaries.

EP-HU-06i Establish access for both adult and juvenile coho salmon to suitable habitat where practicable.

EP-HU-06j Upgrade all county culverts already identified as passage barriers and prioritized for repair.

EP-HU-06k Conduct an inventory and prioritize for treatment migration barriers other than county culverts (private roads, tide gates) including Rocky and Washington gulches.

EP-HU-06m Conduct LWD survey, identify location and areas for potential recruitment and/or placement of LWD structures:

a. Map areas where large conifer riparian habitat exists;

b. Increase the canopy by planting appropriate conifer and hardwood species composition along the stream where the canopy is not at acceptable levels. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects;

c. Protect existing LWD structure;

d. Increase the amount of large wood debris in rearing reaches;

e. Provide additional LWD for rearing habitat;

f. Ensure retention of mature trees in the riparian corridor;

g. Establish adequate streamside buffer areas that are protected from vegetation removal; and

h. Protect and maintain habitat associated with instream LWD.

EP-HU-06n Maintain functional riparian habitat. Conduct assessment of historic and present riparian conditions.

EP-HU-06o Develop site specific riparian restoration plans:

a. Restore degraded riparian habitat; and

b. Establish a monitoring program to evaluate success of restoration projects.

EP-HU-06p Maintain and/or attain turbidity and suspended sediment levels beneficial to coho salmon during all life stages. Establish a coordinated turbidity monitoring plan.

EP-HU-06q Reduce input of fine sediments into the stream system by the following actions:

a. Conduct comprehensive road inventory;

b. Carry out priority road related sediment reduction;

c. Implement priorities for road-related sediment reduction projects identified in existing road inventories projects;

d. Identify areas still needing road/erosion inventories;

e. Identify ongoing road maintenance needs;

f. Identify landslide hazard areas such as steep unstable slopes, stream crossings,(other than those identified in the road inventory) and inner gorge area;

g. Conduct pre-project geological surveys and/or reducing management activities within these areas, especially road construction, grading, intensive timber harvests; and

h. Identify and treat bank erosion sites.

EP-HU-06r Assess and establish temperatures beneficial to coho salmon during all life stages by:

a. Evaluating temperature ranges in all tributaries;

b. Reviewing existing temperature data;

c. Identifying data gaps and establish watershed-wide temperature monitoring program; and

d. Determining if temperatures are a concern for coho salmon.

EP-HU-06t Prevent point and non-point source pollution (i.e. septic systems, livestock, household chemicals, petrol-chemicals, herbicides, fertilizer and other pollutants) by actions to:

a. Where necessary, limit direct livestock access to stream, and runoff impacts from livestock pens; and

b. Identify any pollutants that are potentially affecting coho salmon, identify priorities for pollution reduction and strategy to be pursued.

EP-HU-06v Determine and maintain adequate flows for migrating juvenile and adult coho salmon. Develop an inventory of current water rights, and conduct a field survey of water withdrawals in main-stem and tributaries.

EP-HU-06w Maintain open space lands (e.g., agriculture, forestland) for water retention and limit addition of impervious surfaces in the watershed.

EP-HU-06x Identify socioeconomic impacts of watershed management and future possible solutions.

EP-HU-06y Facilitate and sustain a well informed watershed community with regards to coho habitat issues.

EP-HU-06z Ensure that there are adequate incentives for landowners who choose to protect and/or restore watershed processes.

EP-HU-28 Support and encourage urban stream day-lighting efforts in Arcata and Eureka to reconnect and restore coho salmon habitat.

8.1.11 EEL RIVER HYDROLOGIC UNIT

ER-HU-01 Support the existing watershed cooperative working groups and the formation of new groups where necessary.

ER-HU-02 Acknowledge that the pike minnow is a problem and support efforts to control it.

ER-HU-03 Continue ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD through:

a. LWD placement;

b. Management to promote conifer recruitment; and

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and incentives to landowners, such as technical support.

ER-HU-05 Recommend that the SWRCB make a high priority the identification of unauthorized diversions and enforcement actions to stop them in the Eel River HU.

ER-HU-07 Encourage the CHERT to incorporate coho salmon friendly measures.

ER-HU-08 Develop a plan to restore an adequate migration corridor in the mainstem Eel River.

ER-HU-09 Assess and prioritize sediment sources, including roads.

ER-HU-10 Treat prioritized sediment sources, including roads.

ER-HU-11 Identify coho salmon rearing impacts from Van Arsdale outplanting site.

ER-HU-12 In cooperation with agencies and landowners, plan to re-establish estuarine function, restore and maintain historical tidal areas, backwater channels and salt marsh.

ER-HU-13 Request that Caltrans assess, prioritize, and treat culverts that are barriers to passage on Highway 101. Identify barriers to passage and prioritize them for removal, through collaborative efforts with other agencies.

8.1.11.1 Ferndale HSA

ER-FE-01 Encourage the Salt River Local Implementation Plan to incorporate coho salmon-friendly measures, in cooperation with the agencies. For the Salt River Local Implementation Plan to be effective, assessment prioritization and treatment of sediment sources in the watershed must be completed.

ER-FE-02 Support the acquisition of conservation easements as an incentive for landowners to conserve and enhance habitat.

8.1.11.2 Van Duzen River HSA

ER-VD-01 Develop a plan to restore and maintain tributary and mainstem habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage. The plan should

a. Evaluate management techniques;

b. Implement the identified strategy; and

c. Address permitting complexity for identifying implementation measures.

ER-VD-02 Implement the plan to restore and maintain tributary and mainstem habitat connectivity where low flow or sediment aggradation is restricting coho salmon passage.

ER-VD-03 Recommend that the CHERT incorporate coho salmon-friendly measures.

ER-VD-04 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement; and

b. Improvement of existing riparian zones through plantings, release and recruitment of conifers, and control of alders, blackberries, and other competitors.

ER-VD-05 Assess and prioritize excess sediment sources including roads.

ER-VD-06 Treat excess sediment sources including roads.

8.1.11.3 Scotia HSA

ER-SC-02 Evaluate the benefits to coho salmon of removing the barrier on Bridge Creek.

8.1.11.4 South Fork Eel River HA

ER-SF-01 Explore opportunities to acquire conservation easements with conditions that provide for benefits to coho salmon.

8.1.11.5 Weott HSA

ER-WE-01 Support the DPR's efforts to complete the storm proofing of Bull Creek watershed.

ER-WE-02 Support the DPR and private property owners planting of trees and implement other habitat enhancement as necessary in the Bull and Salmon Creek watersheds.

ER-WE-03 Request that Caltrans assess, prioritize, and treat culverts that are barriers to passage along Avenue of the Giants and Highway 101. Identify barriers to passage and prioritize them for removal, through collaborative efforts with other agencies.

8.1.11.6 Benbow HSA

ER-BE-01 Support assessment of the entire watershed.

ER-BE-04 Request that the CDF monitor Non-industrial Timber Management Plans to ensure that they are properly implemented.

8.1.11.7 Laytonville HSA

ER-LA-01 Support continued watershed restoration efforts, including measures to reduce temperatures in Ten Mile Creek.

ER-LA-02 Support efforts to prioritize and treat culverts on county roads that are barriers.

ER-LA-03 Encourage the county to coordinate with landowners on the removal of barriers on private property.

ER-LA-04 Support efforts by the county sheriff to enforce laws against dumping and the Department of Health to clean up dumped materials.

ER-LA-06 Encourage cities, counties, and Caltrans to adopt maintenance manuals that protect coho salmon habitat (e.g., standards for sidecasting of spoils and identification of spoils disposal sites).

ER-LA-07 To minimize and reduce the effects of water diversions, take actions to improve SWRCB coordination with other agencies to address season of diversion, off-stream reservoirs, bypass flows protective of coho salmon and other anadromous salmonids and natural hydrograph, and avoidance of adverse impacts caused by water diversion.

8.1.11.8 Outlet Creek HSA

ER-OC-01 Prepare a technical assessment of Outlet Creek watershed, develop recommendations to restore long-term function, and prioritize implementation.

ER-OC-02 Encourage the City of Willits to become involved in planning for coho salmon recovery and to:

a. Assess, prioritize, and treat barriers to passage;

b. Address water quality issues;

c. Modify facility maintenance practices as necessary; and

d. Evaluate land use planning and revise plans as appropriate.

ER-OC-03 Encourage the NCRWQCB to upgrade the basin plan to benefit coho salmon.

8.1.12 CAPE MENDOCINO HYDROLOGIC UNIT

CM-HU-01 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade by the placement of LWD in stream channels to improve channel structure and function

CM-HU-02 Assess and prioritize of sources of excess sediment including roads.

CM-HU-03 Treat of sources of excess sediment, including roads.

CM-HU-04 Investigate the feasibility of restoring estuarine function to maximize habitat for coho salmon.

CM-HU-05 Prioritize and upgrade all county culverts identified as passage barriers.

CM-HU-06 Conduct an inventory and prioritize for treatment migration coho salmon barriers other than county culverts.

Recommendations are presented separately for the four subbasins of the Mattole River HSA.

8.1.12.1 Southern Subbasin Mattole River HSA

CM-MS-01 Encourage elimination of unnecessary and wasteful use of water to improve stream surface flows and coho salmon habitat through outreach and education of water and conservation practices.

CM-MS-02a Ensure protection of the high quality habitat found in the Mattole River headwaters and historic coho salmon streams.

CM-MS-02b Protect high quality habitat found in the South Fork of Vanauken, Mill, Stanley, Thompson, Yew, and Lost Man creeks through recognition of current land management practices and encourage private landowners to continue land stewardship.

CM-MS-03 Promote a cooperative effort to establish monitoring stations at appropriate locations to monitor in-channel sediment (or turbidity) both in the lower basin and in the lower reaches of major tributaries.

CM-MS-04 Support the assessment, prioritization, and treatment of sources of excess sediment.

CM-MS-05 Study herbicide use with respect to impacts on coho salmon. Encourage lead agencies to consider herbicide application in CEQA and NEPA review.

CM-MS-06 Follow the NCRWQCB suggested best management practices (BMPs) to protect water quality from the ground application of pesticides.

CM-MS-07 Work with University of California Cooperative Extension (UCCE) specialists to monitor summer water and air temperatures and flow in cooperation with landowners using Department-accepted protocols.

CM-MS-08 Request that Mendocino County evaluate all parcels (new and existing) for their impacts to coho salmon habitat.

CM-MS-09 Request that Mendocino County investigate promoting cluster development away from streams to protect coho salmon.

CM-MS-10 Provide incentives to landowners to protect habitat and reduce water use.

CM-MS-11 Develop educational materials for landowners explaining how they can protect coho salmon.

CM-MS-12 Request that the SWRCB begin the process of declaring the southern subbasin to be fully appropriated in the spring and summer.

CM-MS-13 Request that the SWRCB make the enforcement of water rights in this watershed a priority.

CM-MS-14 Pursue opportunities to acquire fee title, easement, and water rights from willing sellers.

CM-MS-15 Encourage the planting of trees in riparian areas when appropriate and where conditions are suitable.

8.1.12.2 Western Subbasin Mattole River HSA

CM-MW-01 Assess current levels of LWD, determine amount necessary for improved flushing, pooling and habitat conditions for coho salmon, facilitate immediate placement and develop a plan for long-term recruitment.

CM-MW-02 Cooperate in establishing monitoring stations at appropriate locations (e.g., Squaw, Honeydew, and Bear creeks) to monitor in-channel sediment and track aggraded reaches in the lower basin and in the lower reaches of major tributaries.

CM-MW-03 Support the assessment, prioritization, and treatment of sources of excess sediment.

CM-MW-04 Encourage the monitoring of summer water and air temperatures using Department-accepted protocols. Continue temperature monitoring efforts in Stansberry, Mill (RM 2.8) Clear, Squaw, Woods, Honeydew Bear, North Fork Bear, South Fork Bear, Little Finley, Big Finley, and Nooning creeks, and expand efforts into other subbasin tributaries.

CM-MW-05 Develop a plan to manage near-stream buffers to reduce the effects of solar radiation and to moderate air temperatures.

CM-MW-06 Encourage the assessment, prioritization, reclamation and enhancement of riparian habitat.

CM-MW-07 Recognize and support ongoing efforts of landowners, the BLM, and others to improve habitat conditions for coho salmon.

CM-MW-08 Recommend coordinated, expedited processing of SWRCB and 1600 agreements for projects that are intended to reduce summer diversions.

CM-MW-09 Develop a public education program to raise awareness of the habitat needs of coho salmon and how the community, especially landowners, can improve coho salmon habitat.

CM-MW-10 Develop incentives for landowners and communities to reduce summer water withdrawals and enhance habitat.

CM-MW-11 Develop programs to support continued land-use patterns and discourage conversions and subdivisions.

CM-MW-12 Support a plan for mapping unstable soils and use of the information to guide land-use decisions, road design, and other activities that can increase erosion.

8.1.12.3 Northern Subbasin Mattole River HSA

CM-MN-01 Encourage tree planting and other vegetation management to improve canopy cover, especially in Conklin, Oil, Green Ridge, Devils, and Rattlesnake creeks.

CM-MN-02 Encourage cooperative efforts for treatment of stream-bank erosion sites to reduce sediment yield to streams, especially in Sulphur, Conklin, and Oil creeks and the lower reaches of the North Fork Mattole River.

CM-MN-03 Due to high incidence of unstable slopes in this subbasin, any permitting of future sub-division development proposals should be based on existing county-imposed forty acre minimum parcel sub-division ordinances.

8.1.12.4 Eastern Subbasin Mattole River HSA

CM-ME-01 Continue to conduct and implement road and erosion assessments, especially in Middle, Westlund, Gilham, Sholes, Blue Slide, and Fire creeks.

CM-ME-02 Encourage tree planting and other vegetation management to improve canopy cover, especially in Dry and Blue Slide creeks.

CM-ME-03 Encourage cooperation at stream-bank erosion sites to reduce sediment yield to streams, especially in Middle, Westlund, Gilham, North Fork Fourmile, Sholes, Harrow, Little Grindstone, Grindstone, Eubank, and McKee creeks.

8.2 CENTRAL CALIFORNIA COAST ESU

Recommendations for the CCC Coho ESU are presented in this section.

8.2.1 MENDOCINO COAST HYDROLOGIC UNIT

MC-HU-01 Encourage local jurisdictions to update general plans to include measures to protect coho salmon.

MC-HU-03 Encourage the County to limit development in the 100-year flood plain where the development would adversely affect coho salmon or their habitat.

MC-HU-04 Encourage Mendocino and Sonoma counties to adopt county grading ordinances.

MC-HU-05 Encourage the County to expand the CEQA checklist for Mendocino County to include coho salmon.

MC-HU-06 Increase stream complexity by actions to:

a. Retain current limited supply of LWD, boulders, and other structure-providing features;

b. Install new LWD, boulders, and other features immediately; and

c. Restore riparian vegetation to provide for future recruitment of LWD.

MC-HU-07 Support the assessment, prioritization, and treatment of sediment sources at an HSA level.

MC-HU-08 Determine site-specific recommendations, including incentives, to remedy high temperatures. Depending on the terrain and aspect, examples could include riparian planting to increase shade to reduce high ambient temperature and raise humidity along streams.

MC-HU-09 Map unstable soils and use that information to guide land-use decisions, road design, THPs, and other activities that can promote erosion.

MC-HU-10 Provide education and training on water diversion practices and facilitate compliance with pertinent regulations (e.g., FGC §1600 *et seq*., CFPR 916.9, California water rights law).

MC-HU-11 Improve pool frequency and depth by actions to:

a. Continue to treat existing upslope sediment sources; and

b. Avoid or minimize land ownership fragmentation/conversion to more intensive uses.

MC-HU-12 Discourage poaching of coho salmon by measures to:

a. Cooperate with and provide incentives to landowners to maintain road and trail closures to be effective against trespass;

b. Encourage monitoring of road closures and timely repair of defective or damaged road closure systems;

c. Promote CalTIP, especially how it might apply to spawning coho salmon; and

d. Report un-permitted road use to local, State, and Federal enforcement personnel during periods when coho salmon are running.

MC-HU-13 To promote channel complexity and provide rearing habitat, investigate the desirability and feasibility of reintroduction of beavers.

MC-HU-14 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. Management to promote conifer recruitment; and

b. Incentives to landowners, such as technical support.

MC-HU-15 Maintain or improve instream flows by actions to:

a. Avoid or minimize increases in water use; and

b. Provide incentives to remove or convert direct diversions to off-stream storage and restrict the season of diversion to December through March.

MC-HU-16 The Department, the SWRCB, the RWQCB, the CDF, Caltrans, and counties, in cooperation with NOAA Fisheries, should evaluate the rate and volume of water drafting for dust control in streams or tributaries and where appropriate, minimize water withdrawals that could impact coho salmon. These agencies should consider existing regulations or other mechanisms when evaluating alternatives to water as a dust palliative (including EPA-certified compounds) that are consistent with maintaining or improving water quality.

MC-HU-17 Maintain or re-establish geographic distribution of coho salmon by continuing to allocate substantial improvement efforts towards identified biological refugia spawning coho salmon populations, and/or otherwise suitable habitat conditions accessible to coho salmon.

MC-HU-18 Coordinate with the NCRWQCB to implement water quality monitoring and streamline permitting of coho salmon habitat restoration projects (RWQCB 401, USACE 404, NOAA Fisheries, and USFWS permitting).

MC-HU-19 Encourage funding authorities to allocate adequate resources to prioritize and upgrade culverts to provide coho salmon passage within the range of coho salmon to pass 100-year flows and the expected debris loads (e.g. LWD that might be mobilized).

MC-HU-20 Decrease coarse sediment delivery by implementing actions to work with:

a. Landowners, other resource professionals, and agencies to identify areas of increased risk of mass wasting to enable avoidance or mitigation of triggering activities; and
b. Transportation system (State, county, and private road and rail) construction and maintenance personnel to identify risks and mitigation measures for mass wasting such as replacing culverts with bridges, minimizing fill volumes on culverts, and constructing critical dips at culverts.

MC-HU-21 Decrease fine sediment loads by actions to:

a. Abandon riparian road systems and/or upgrade roads and skid trails that deliver sediment to adjacent water courses;
b. Limit winter use of unsurfaced roads and recreational trails by unauthorized and impacting uses;
c. Minimize the density of road and trail crossings of water courses;
d. Encourage out-sloping roads with rolling dips as the standard, wherever feasible, for all roads, and especially unsurfaced roads; and
e. Work with landowners to identify and modify practices such as road maintenance that generate fine sediment.

MC-HU-22 Develop erosion control projects similar to the North Fork Ten Mile River erosion control plan.

8.2.1.1 Albion River HSA

MC-AR-01 Place instream structures to improve gravel retention and habitat complexity.

MC-AR-02 Provide technical assistance and incentives to landowners in developing and implementing sediment reduction plans to meet requirements of the CWA TMDL, making watersheds with an implementation schedule the highest priority.

MC-AR-03 Conduct collaborative evaluations of priorities for treatment of barriers such as Fish Passage Forum.

MC-AR-04 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, such as technical support.

MC-AR-07 Protect and enhance riparian buffer zones through conservation planning, acquisition, and easements, where necessary and with willing landowners to protect coho salmon.

MC-AR-10 Encourage coordination of large wood placement in streams as part of logging operations and road upgrades to maximize size, quality, and efficiency of effort.

MC-AR-11 Encourage, when necessary and appropriate, restricted access to unpaved roads in winter to reduce road degradation and sediment release. Where restricted access is not feasible, encourage measures such as rocking to prevent sediment from reaching streams with coho salmon.

MC-AR-12 Conduct comprehensive subbasin erosion control "storm proofing" combined with installation of LWD into streams.

MC-AR-13 Modify stream barriers to allow coho salmon passage while maintaining LWD.

8.2.1.2 Big River HSA

MC-BR-01 To minimize and reduce the effects of water diversions, take actions to improve SWRCB coordination with other agencies to address season of diversion, off-stream reservoirs, bypass flows protective of coho salmon and other anadromous salmonids and natural hydrograph, and avoidance of adverse impacts caused by water diversion.

MC-BR-02 Target Big River for enhancement of instream habitat by installation of LWD.

8.2.1.3 Garcia River HSA

MC-GA-02 Re-establish connectivity of North Fork Garcia River to the mainstem.

MC-GA-05 Provide technical assistance and incentives to Garcia River landowners for developing and implementing sediment reduction plans to meet the requirements of the CWA TMDL.

MC-GA-06 Utilize as a model for erosion reduction and LWD placement the comprehensive approach practiced in the South Fork of the Garcia River.

MC-GA-07 Investigate stream nutrient enrichment and cycling needs for coho salmon.

MC-GA-08 Study the Garcia River estuary using the Garcia River Estuary Enhancement Feasibility Study, as well as new information, to consider restoring estuary functions that would benefit coho salmon.

MC-GA-09 Encourage coordination of LWD in streams as part of logging operations and road upgrades to maximize size, quality, and efficiency of effort.

MC-GA-11 Maintain the following tributaries to provide coldwater input to the Garcia River mainstem: Hathaway, North Fork, Rolling Brook, Mill Creek (lower Garcia River), South Fork, Signal, Mill Creek (upper Garcia River).

MC-GA-12 Work with landowners to plant riparian zones of Blue Waterhole, Inman Creek, and Pardaloe Creek with the goal of reducing instream temperatures and inputs into the Garcia River mainstem, and providing a long-term source of conifer LWD.

MC-GA-13 Encourage, when necessary and appropriate, restricted access to unpaved roads in winter to reduce road degradation and sediment release. Where restricted access is not feasible, encourage measures such as rocking to prevent sediment from reaching streams with coho salmon.

MC-GA-14 Protect and enhance riparian buffer zones through conservation planning, acquisition, and easements, where necessary and with willing landowners to protect coho salmon.

MC-GA-16 Excavate a geomorphically designed channel in the lower North Fork Garcia River, which currently goes subsurface in the summer months, stranding thousands of salmonids. Juvenile coho salmon should be rescued until restoration project is undertaken and completed.

MC-GA-17 Work with landowners to plant conifers in the lower mainstem Garcia River from Eureka Hill road Bridge to Windy Hollow road with the goal of reducing stream temperature, providing bank stability and long-term LWD. Note the lower mainstem is currently seeing a reemergence of steelhead spawning and rearing life history. Reductions of mainstem temperature to a suitable range for coho salmon would be a very favorable development.

MC-GA-18 Consider projects to open logjam migration barriers while maintaining LWD in the North Fork, South Fork, and Fleming Creek.

MC-GA-19 Complete the remaining 25% of erosion control sites, identified in the South Fork Garcia River by the Trout Unlimited North Coast Coho Project.

MC-GA-21 Place large woody debris in Inman Creek, South Fork Garcia River, Signal Creek, and North Fork Garcia River, where necessary and with willing landowners.

MC-GA-22 Plant redwood trees in the lower seven miles of the Garcia River mainstem between Eureka Hill road and Windy Hollow road for long term LWD and bank stability and reduction of instream temperatures (which are now close to being suitable for coho salmon).

8.2.1.4 Navarro River HSA

MC-NA-03 Investigate stream nutrient enrichment and cycling needs for coho salmon.

MC-NA-04 Supplement ongoing efforts to provide short-term and long-term benefits to coho salmon by restoring LWD and shade through:

a. LWD placement;

b. Management to promote conifer recruitment;

c. Improvement of existing riparian zones through plantings, release of conifers, and control of alders, blackberries, and other competitors; and

d. Incentives to landowners, such as technical support.

MC-NA-06 The SWRCB, the Department, and NOAA Fisheries should make enforcement of pertinent laws and codes concerning illegal and unpermitted dams and diversions a high priority for action. Ongoing education and incentives and assistance with water conservation are called for.

MC-NA-07 Comprehensive, subbasin wide, erosion control and LWD installation is being implemented by Mendocino Redwood Company in partnership with the Department through the North Coast Coho Project in the Little North Fork. This approach of "storm proofing" key subbasins needs to be fully implemented in the key subbasins of Flynn, Dutch Henry, John Smith, Minnie, Horse Camp and German creeks. These tributaries have been identified as high priority in the Navarro River Restoration Plan.

MC-NA-08 Provide technical assistance and incentives to Navarro River landowners for developing and implementing sediment reduction plans to meet the requirements of the CWA TMDL.

MC-NA-09 Encourage coordination of large wood placement in streams as part of logging operations and road upgrades to maximize size, quality, and efficiency of effort.

MC-NA-10 Protect and enhance riparian buffer zones through conservation planning, acquisition, and easements, where necessary and with willing landowners to protect coho salmon.

MC-NA-11 Encourage, when necessary and appropriate, restricted access to unpaved roads in winter to reduce road degradation and sediment release. Where restricted access is not feasible, encourage measures such as rocking to prevent sediment from reaching streams with coho salmon.

8.2.1.5 Noyo River HSA

MC-NO-02 Investigate the role of the Pudding Creek Dam impoundment in coho salmon migration and freshwater survival rate; repair dam as appropriate.

MC-NO-04 Request that Mendocino County implement a sediment reduction plan related to water quality.

MC-NO-05 Support funding to address barriers to passage on the California Western Railway right-of-way.

MC-NO-06 Evaluate the biological justification for the egg-taking station on the South Fork Noyo River.

8.2.1.6 Ten Mile River HSA

MC-TM-01 Complete implementation of erosion control sites identified in Hawthorne Campbell, Department, and TU North Coast Coho Project on North Fork Ten Mile. Encourage development of similar projects in other coho salmon subbasins.

MC-TM-02 Protect and enhance riparian buffer zones through conservation planning, acquisition, and easements, where necessary and with willing landowners to protect coho salmon.

MC-TM-03 Encourage, when necessary and appropriate, restricted access to unpaved roads in winter to reduce road degradation and sediment release. Where restricted access is not feasible, encourage measures such as rocking to prevent sediment from reaching streams with coho salmon.

MC-TM-05 Provide technical assistance and incentives to Ten Mile River landowners for developing and implementing sediment reduction plans to meet the requirements of the CWA TMDL.

MC-TM-06 Evaluate the biological justification for the egg-taking station on the South Fork Noyo River.

8.2.1.7 Gualala River HSA

MC-GU-02 Complete comprehensive assessment/implementation of erosion control measures in entire North Fork basin.

MC-GU-03 Enforce existing bypass flow permit conditions of the SWRCB and the Department for the North Gualala Water Company diversion on North Fork Gualala River.

MC-GU-04 Investigate expanding North Fork riparian zone through acquisition/easement from willing participants where necessary.

MC-GU-05 Encourage coordination of large wood placement in streams as part of logging operations and road upgrades to maximize size, quality, and efficiency of effort.

MC-GU-07 Consider Haupt Creek for acquisition/easement of old growth redwood sections from willing participants.

MC-GU-09 Recovery goal should be to restore conditions in all tributaries that historically contained coho salmon.

MC-GU-11 Enforce all pertinent laws relating to summer dams and diversions to provide adequate year round flows and coho salmon passage. Baseline flow (i.e., hydrograph) studies are needed.

MC-GU-12 Protect and enhance riparian buffer zones through conservation planning, acquisition, and easements, where necessary and with willing landowners to protect coho salmon.

MC-GU-13 Take a critical look at emerging conversion of timberland and oak woodlands in the Gualala River.

8.2.2 RUSSIAN RIVER HYDROLOGIC UNIT

RR-HU-02 Encourage the RWQCB to upgrade the Basin Plan to benefit salmonids (revisions have been proposed by the RWQCB).

RR-HU-03 Identify water diverters; request that SWRCB review and/or modify water use based on the needs of coho salmon and authorized diverters.

RR-HU-04 Assess, prioritize, and develop plans to treat barriers to passage in all HSAs.

RR-HU-06 Assess riparian canopy and impacts of exotic vegetation (especially *Arundo donax*), prioritize, and plan riparian habitat reclamation and enhancement programs.

RR-HU-07 Implement the Sotoyome Resource Conservation District's Fish Friendly Farming Program within Sonoma and Mendocino counties.

RR-HU-08 Implement Coho Salmon Captive Broodstock Program:

a. Continue genetic analysis of source stocks for coho salmon broodstock. Recent genetic data produced by the Bodega Marine Laboratory and the NOAA Fisheries laboratory at Santa Cruz identifies that source populations in the Russian River and Marin County are genetically distinct. Further analysis of other broodstock year classes needs to be completed by NOAA Fisheries to weigh the risks of inbreeding and outbreeding depression in the captive broodstock program. A review of stocking history may help determine how locally adapted stocks can be utilized to enhance variability and reduce risk of extirpation. This review should be completed before mating protocols are finalized and implemented. The Department has completed this review in the Russian River HU, and the review for Bodega-Marin Coastal HU is underway;

b. Stock first priority barren streams. First priority streams are streams the Department has identified with good habitat condition resulting from complete restoration or unimpaired functions include Felta and Mill creeks (tributary to Dry Creek west of Healdsburg), Freezeout, Willow and Sheephouse creeks (near Duncans Mills), and Ward Creek (tributary to Austin Creek). Identify additional streams that may be suitable for stocking as restoration occurs;

c. Develop and implement a monitoring and evaluation program to adaptively manage the coho salmon broodstock program. Coordinate and implement a monitoring and evaluation program that would meet high and medium priority monitoring objectives as outlined in the coho salmon hatchery genetic management plan;

d. Develop, implement, and evaluate experimental release protocols for the captive broodstock program;

e. Review and revise long-term hatchery program goals based on results of the monitoring and evaluation program implemented in the experimental captive broodstock program; and

f. Develop and implement a long-term monitoring program for coho salmon abundance trends in suitable index streams that have recent (within eight years) coho salmon presence or that will be supplemented

with the captive broodstock program. The Department has contracted Humboldt State University to develop these protocols in coordination with NOAA Fisheries.

RR-HU-09 Review and develop preferred protocols for Pierce's Disease Control that would maintain a native riparian corridor and develop an outreach program.

RR-HU-10 Throughout the HU, advise Sonoma County to consider recommendations to offset impacts from county policies and operations, as developed by the FishNet program in their report, Effects of County Land Use Policies and Management Practices on Anadromous Salmonids and Their Habitat (Harris et al, 2001). Advise Mendocino County to consider recommendations to offset impacts from county policies and operations, as developed by the Five County effort.

RR-HU-11 Sonoma and Mendocino counties should develop grading and erosion control standards supported by a grading ordinance, to minimize sediment impacts to coho salmon habitat.

RR-HU-12 Restore coho salmon passage at county structures on all streams inhabited by coho salmon, as identified in the Russian River Fish Passage Assessment report (Taylor, March 2003). Encourage expansion of coho salmon passage inventories as needed to use a comprehensive watershed approach to coho salmon passage. Integrate coho salmon passage projects at county facilities with coho salmon passage improvements involving other landowners, throughout targeted coho salmon watersheds.

RR-HU-13 Sonoma County Public Works and Parks departments should adopt and implement the best management practices in Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance (FishNet 4C 2004) after review and approval by State regulatory agencies is completed. Mendocino County Public Works should adopt the Five County Roads manual after review and approval by State regulatory agencies is completed.

RR-HU-14 Sonoma and Mendocino County's Public Works, Water Agencies and Flood Control District's should reduce native riparian vegetation clearing and sediment removal adjacent to and in streams with coho salmon. Retain LWD within streams to the extent possible. When woody material is removed it should be stored and made available for stream enhancement projects.

RR-HU-15 Sonoma and Mendocino County planning and public works should promote alternatives to conventional bank stabilization for public and private projects, including bioengineering techniques.

RR-HU-16 Sonoma and Mendocino counties and incorporated areas should review development set-backs for adequacy in protecting critical streams inhabited by coho salmon, and revise as needed. Promote streamside conservation measures, including conservation easements, setbacks, and riparian buffers.

RR-HU-17 Sonoma and Mendocino County Public Works, Transportation Departments, Parks and Open Space Districts, should inventory, evaluate and fix problem roads which systematically contribute sediment to streams inhabited by coho salmon.

RR-HU-18 Support efforts and develop county, city, and other local programs to protect and increase instream flows for coho salmon. Sonoma and Mendocino counties should have policies to minimize impervious surfaces and promote surface water retention. The counties should participate in regional water management planning through the general plan process and in other venues as appropriate.

8.2.2.1 Russian River Mainstem

RR-MS-01 Manage summer flows in the mainstem of the Russian River to the benefit of rearing coho salmon and the estuary, while ensuring that all existing legal water uses and rights are accounted for.

RR-MS-02 Investigate the opportunity to operate the estuary as a natural system, allowing periods of closure to benefit coho salmon rearing, and appropriate timing of opening to benefit coho salmon migration/emigration.

RR-MS-03 Explore adjusting the operation of Mirabel Dam within confines of existing water rights and legal uses to improve passage of downstream migrants.

RR-MS-04 Evaluate the feasibility of bypassing large dams.

RR-MS-05 Update temperature analyses below Coyote Dam and Warm Springs Dam and review dam management.

RR-MS-06 In upper mainstem, prioritize and plan habitat restoration programs and projects.

8.2.2.2 Guerneville HSA

RR-GU-01 Encourage local agencies to implement recommendations of completed non-point source sediment assessments.

RR-GU-02 Assess, prioritize, and treat sources of excess sediment.

RR-GU-03 Supplement first priority barren streams as part of the coho salmon broodstock program. Within the Guerneville HSA, these streams include Willow, Sheephouse, Freezeout, Dutchbill and Green Valley creeks.

RR-GU-04 Acquire from willing sellers conservation easements or land in fee title in habitat essential for coho salmon.

RR-GU-06 Identify water diverters; request that SWRCB review or modify water use based on the needs of coho salmon and authorized diverters. Monitor and identify problems and prioritize needs in terms of changes to water diversion, in particular Green Valley and Dutchbill creeks, which have been identified as current or potential streams inhabited by coho salmon that go dry in some years.

8.2.2.3 Austin Creek HSA

RR-AC-01 Encourage Sonoma County to implement recommendations of completed non-point source sediment assessments.

RR-AC-02 Assess, prioritize, and treat sources of excess sediment.

RR-AC-03 Supplement first priority barren streams with the coho salmon broodstock program, such as Ward Creek. Identify additional streams that may be suitable for stocking as restoration occurs.

8.2.2.4 Warm Springs HSA

RR-WS-01 Develop plans to improve riparian vegetation in Dry Creek and its tributaries. Develop and implement riparian improvements through land-use planning, use of conservation easements, and implementation of the Sotoyome Resource Conservation District's Fish Friendly Farming Program.

RR-WS-02 Support implementation of measures to modify flows in Dry Creek to provide summer rearing habitat for coho salmon.

RR-WS-03 Supplement first priority barren streams as part of the coho salmon broodstock program, such as Mill and Felta creeks. Identify additional streams that may be suitable for stocking as restoration occurs.

RR-WS-04 Review and develop preferred protocols for Pierce's Disease Control that would maintain a native riparian corridor and develop an outreach program.

RR-WS-06 Assess, prioritize, and develop plans to treat sources of excess sediment.

RR-WS-07 Increase habitat structure and complexity in Dry Creek to enhance habitat diversity, and provide depositional areas for spawning gravels for coho salmon (i.e., place LWD or large boulder structures).

8.2.2.5 Mark West Creek HSA

RR-MW-01 Reduce habitat fragmentation and implement riparian improvements through land-use planning and use of conservation easements from willing landowners.

RR-MW-02 Develop plans to improve instream habitat conditions.

RR-MW-04 Assess, prioritize, and develop plans to treat sources of excess sediment.

8.2.2.6 Santa Rosa Creek HSA

RR-SR-01 Encourage Sonoma County and the City of Santa Rosa to reduce habitat fragmentation and implement riparian improvements through land-use planning and use of conservation easements from willing landowners.

RR-SR-02 Evaluate and develop solutions to problems caused by channelization.

RR-SR-03 Assess, prioritize, and develop plans to treat sources of excess sediment.

8.2.2.7 Forsythe Creek HSA

RR-FO-01 Improve migration and summer/overwintering habitat through riparian restoration and erosion control.

RR-FO-02 Assess, prioritize, and develop plans to treat sources of excess sediment.

8.2.2.8 Geyserville HSA

RR-GE-01 Maintain and improve riparian condition and water temperature through land use planning and conservation easements from willing landowners.

RR-GE-03 Assess, prioritize, and develop plans to treat sources of excess sediment.

8.2.3 BODEGA AND MARIN COASTAL HYDROLOGIC UNITS

BM-HU-01 Implement BMPs for road projects. Support Sonoma and Marin County Departments of Public Works, Caltrans, and other appropriate agencies to implement and maintain environmentally sound upgrades, modifications, and new construction of road projects, including culverts and stream crossings.

BM-HU-02 Continue to implement erosion control projects that were assessed and inventoried in sediment assessment plans throughout watersheds of the HU.

BM-HU-03 To avoid and minimize the adverse effects of water diversion on coho salmon, improve coordination between the SWRCB, the Department, and other agencies, to promote flows that will provide for a natural hydrograph, and to address protective conditions, such as by-pass flows, season of diversion, and off-stream storage.

BM-HU-04 Encourage local governments to incorporate protection of coho salmon in any flood management activities.

BM-HU-05 Encourage counties to implement performance standards in stormwater management plans.

BM-HU-06 On private and public lands, address issues of low flow by increasing riparian protection restoration, sediment control, and employing BMPs that encourage permeability and infiltration.

BM-HU-07 Continue outreach, education, and enforcement related to household hazardous waste and hazardous materials spills in creeks.

BM-HU-08 Encourage the cultivation and availability of locally indigenous native plants for use in restoration and bank stabilization.

BM-HU-09 Investigate opportunities for restoring historic runs in identified watersheds.

BM-HU-10 Continue to support landowners and the Marin RCD to restore riparian zones and manage livestock to increase stream protection and soil retention. Encourage sustainable land management practices and control of sediment sources in agricultural zones.

BM-HU-11 Continue to support the many active watershed groups in the HU, encouraging a focus on coho salmon restoration where appropriate.

BM-HU-12 Implement coho salmon passage improvements as identified in inventories conducted by the Salmon Protection and Watershed Network (SPAWN), Taylor and Associates, Trout Unlimited and the NPS. Expand inventories as needed for a comprehensive watershed approach for coho salmon passage.

BM-HU-13 County planning, public works, open space, and fire departments should continue to implement FishNet 4C priority goals for this region, which include:

a. Enact and enforce Marin County Streamside Conservation Area Ordinance;

b. Adopt and implement Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance (FishNet 4C 2004);

c. Systematically work to restore coho salmon passage at county facilities; and

d. Address issues of sediment from roads through restoration and education.

BM-HU-14 Monitor the effectiveness and maintenance of watershed restoration projects (e.g., Sonoma County Coastal Wetland Enhancement Plan; Walker Creek Watershed Enhancement Plan; San Geronimo Creek Watershed Sediment Source Sites Assessment and Evaluation; Lagunitas Creek Final Sediment and Riparian Management Plan; and Watershed Assessment and Erosion Prevention Planning Project for the Redwood Creek Watershed). Augment inventories as needed.

8.2.3.1 Salmon Creek HSA

BM-SA-01 Coordinate efforts of involved agencies in review of plans for timber harvest and vineyard conversion. Support appropriate entities in the development and implementation of standards and BMPs for agriculture to reduce pathogen, nutrient, and sediment loadings to creeks.

BM-SA-02 Continue to implement erosion control projects that were assessed and inventoried in sediment assessment plans, and monitor effectiveness and maintenance of past and current watershed restoration projects. Augment surveys as necessary.

BM-SA-03 Continue to fund and support landowners to restore riparian zones and manage livestock to increase stream protection and soil retention. Encourage sustainable land management practices and control sediment sources in agricultural zones.

BM-SA-04 Implement recommendations of watershed plans consistent with the coho salmon recovery strategy. Review existing, approved watershed management or restoration plans within the range of coho salmon and implement actions consistent with priority recommendations of the coho salmon recovery strategy.

BM-SA-05 Encourage the design of vineyard operations to ensure adequate protection of coho salmon habitat attributes, including riparian corridors, instream flow, and water quality.

BM-SA-06 Support a coho salmon limiting factors assessment of the Salmon Creek estuary.

8.2.3.2 Walker Creek HSA

BM-WA-01 Continue to fund and support landowners and the Marin RCD to restore riparian zones and manage livestock to increase stream protection and soil retention. Address water quality and nutrient loading issues by encouraging sustainable land management practices, controlling sediment sources, protecting riparian zones and employing BMPs that encourage permeability and infiltration.

BM-WA-02 Continue to support active watershed groups, encouraging a focus on coho salmon restoration where appropriate.

BM-WA-03 Assess the water temperature regime during the summer season for three to five years to determine the role of water temperature as a limiting factor in coho salmon production.

BM-WA-04 Support landowners and the Marin RCD in projects to improve channel conditions and restore natural channel geomorphology, including side channels and dense contiguous riparian vegetation.

BM-WA-05 Implement high priority fishery enhancement projects for the reduction of sediment delivery and the restoration of riparian corridors as listed in the Walker Creek Enhancement Plan (2001).

BM-WA-06 Look for opportunities to increase woody debris retention and recruitment.

BM-WA-07 Continue to assess the release of water from Soulajule Reservoir to develop the optimum release for coho salmon.

BM-WA-08 Support a coho salmon limiting factors assessment in Keys Estero and Tomales Bay.

8.2.3.3 Lagunitas Creek HSA

BM-LA-01 Use recommendations of existing sediment source surveys to restore habitat of coho salmon. Augment surveys as necessary. Expand inventories as needed for a comprehensive watershed approach for coho salmon passage.

BM-LA-03 Coordinate with appropriate agencies to restore coho salmon passage at barriers identified by Ross Taylor, SPAWN, and others. Complete any needed surveys of migration barriers.

BM-LA-04 Investigate opportunities for restoring historic runs of coho salmon.

BM-LA-05 Commit ongoing resources and support of stewardship in the basin to include riparian enhancement and protection, sediment source reduction, habitat typing and surveying, coho salmon surveys and counts, water conservation, outreach and education, effectiveness monitoring of projects, and planning and assessment of potential restoration projects to benefit coho salmon.

BM-LA-06 Provide incentives for septic inspection, repair, and replacement to reduce aquatic pollution.

BM-LA-07 Assess, evaluate, and implement habitat restoration actions in Nicasio Creek.

BM-LA-08 Develop a monitoring and assessment program for the estuarine reaches of Lagunitas Creek and inter-tidal reaches of Tomales Bay, looking at impacts to coho salmon rearing and emigration.

BM-LA-09 Consider restoration of Olema Marsh, Bear Valley Creek, and the mouth of Olema Creek, to benefit coho salmon. The restoration should provide rearing habitat refuge during high flows, habitat protection, and food production. Hydrologic connectivity between marshes should be restored.

BM-LA-11 Throughout the Lagunitas Creek drainage, work with private landowners to encourage biotechnical bank stabilization, riparian protections, woody debris retention, and timing of water withdrawals to help protect coho salmon.

BM-LA-12 In the San Geronimo Creek sub-watershed, continue public outreach and education for private landowners, residents, commercial, public utility and county workers regarding best management practices to control erosion, protect riparian vegetation, retain LWD, and minimize disturbance to coho salmon from pets.

BM-LA-13 In the San Geronimo Creek sub-watershed, encourage removal of non-native fish species from stock ponds where they are a threat to coho salmon.

BM-LA-14 In the San Geronimo Creek sub-watershed, Marin County should determine a policy for reviewing new development projects and impacts to the creek from new well construction. The County should consider adopting recommendations for well developments from the local coastal plan.

BM-LA-15 Encourage the NPS to continue practices to benefit coho salmon, including restoration projects, sediment control projects, locating well constructed fences out of riparian zones, repairing headcut gullies as possible, and implementing rotational grazing in locations to minimize erosion and impacts to the creek.

BM-LA-16 Encourage the County of Marin to continue to implement and coordinate the Watershed Protection Agreement Program for additional water hook-ups in Nicasio and San Geronimo creek watersheds.

BM-LA-17 Look for opportunities to restore natural channel form and function in upper watershed to protect summer flows into San Geronimo Creek.

BM-LA-18 Encourage continuation of riparian protection and sediment control projects. Focus on working with landowners to manage livestock to protect riparian areas, and to implement erosion control projects on State and Federal parkland and on private lands (e.g., Devil's Gulch).

BM-LA-21 Continue public outreach and education for private landowners, residents, commercial, public utility and county workers regarding best management practices to control erosion, protect riparian vegetation, retain LWD, and minimize disturbance to coho salmon from pets.

BM-LA-23 Determine policy for reviewing new development projects and well construction. Consider adopting recommendations for well developments from the coastal plan.

8.2.3.4 Bolinas HSA

BM-BO-01 Implement recommendations of completed sediment source surveys. Supplement surveys as necessary.

BM-BO-02 Continue to support restoration efforts on Bolinas and Big lagoons to benefit coho salmon during all life phases and seasons.

BM-BO-03 Work with landowners and appropriate agencies to manage low summer flows for coho salmon, on a watershed basis. Provide support and incentives to protect both fisheries flows and agriculture, including timing of withdrawals, construction of off-site storage facilities, water conservation practices and riparian zone protections. Conduct outreach and education for landowners on these practices.

BM-BO-04 Look for opportunities to increase LWD recruitment and retention.

BM-BO-05 Provide incentives for septic inspection, repair and replacement to improve water quality in both streams and lagoons.

BM-BO-06 Encourage the NPS to provide additional space for Stinson Beach Water District for off-stream storage to protect coho salmon in Easkoot Creek.

BM-BO-07 Identify, prioritize, and treat coho salmon passage barriers in the Redwood Creek drainage.

BM-BO-08 Identify and resolve problems related to trails in these watersheds, including location of trails and access for construction and maintenance of roads and trails.

8.2.4 SAN FRANCISCO BAY HYDROLOGIC UNITS

SF-HU-01 Habitat suitability evaluations in the San Francisco Bay Area should include coho salmon.

SF-HU-02 Where appropriate, apply range-wide recommendations to suitable streams in the San Francisco Bay.

SF-SR-01 Work to restore coho salmon habitat, especially in Arroyo Corte Madera del Presidio and Corte Madera Creek.

8.2.5 SAN MATEO HYDROLOGIC UNIT

SM-HU-02 To minimize and reduce the effects of water diversions, take actions to improve SWRCB coordination with other agencies to address season of diversion, off-stream reservoirs, bypass flows protective of coho salmon and natural hydrograph, and avoidance of adverse impacts caused by water diversion.

SM-HU-03 Develop legislation that will fund county planning for environmentally sound growth and water supply. Work in coordination with the California Department of Housing and Community Development, Association of Bay Area Governments, and other government associations.

SM-HU-04 Implement FishNet 4C priority actions that protect coho salmon.

a. Continue to protect riparian zones on streams inhabited by coho salmon within the coastal zone according to local coastal plan and THP prescriptions. Evaluate the need to apply coastal zone protections to streams inhabited by coho salmon that are not in the coastal zone;
b. Develop, adopt and implement written standards for routine operations and maintenance. Train staff in BMPs;
c. Conduct coho salmon passage assessments and restore coho salmon passage to coho salmon habitat;
d. Conduct road assessments and address issues of sedimentation from county public works and parks roads and trails;
e. Promote alternatives to conventional bank stabilization for public and private projects;

f. Establish adequate spoils storage sites throughout the counties so that material from landslides and road maintenance can be stored safely away from anadromous streams. Coordinate these efforts with Caltrans; and

g. Work to increase county enforcement of permit conditions and erosion control plans on development.

SM-HU-05 Support continued economically sustainable management of forest and agricultural lands in the range of coho salmon to reduce the potential for conversion to residential or commercial development.

8.2.5.1 San Gregorio Creek HSA and Pescadero Creek HSA

SM-SG-01 Minimize take attributable to diversion of stream flow. Potential take results from three primary impacts to habitat: 1) reduced rearing habitat for juveniles, 2) reduced flows necessary for smolt emigration, and 3) reduced flows necessary for adult immigration. This recommendation would develop and support alternatives to diversion of stream flow, where the alternatives may include operation of off-stream reservoirs, development of infrastructure necessary for conjunctive use of stream flow, and use of desalinated ocean water.

SM-SG-02 Conduct a watershed assessment in San Gregorio Creek that addresses impacts to coho salmon.

SM-SG-03 Conduct a comprehensive assessment of watershed processes (e.g., hydrology, geology, fluvial-geomorphology, water quality, vegetation), instream habitat, and factors limiting coho salmon production. Use the assessment results to develop a plan for restoration of coho salmon passage, instream habitat, and upslope erosion control, for implementation by cooperating landowners/managers.

SM-SG-04 Implement BMPs designed to reduce erosion of soil and consequential sedimentation of instream habitat attributable to roads (e.g., practices described in the California Salmonid Stream Habitat Restoration Manual).

SM-SG-05 Implement BMPs designed to reduce bank erosion, water temperature, and removal of LWD by improving the form and function of the riparian forest. These BMPs include livestock exclusion fencing, reclamation and reconstruction of flood plain, and active revegetation.

SM-SG-07 Request that the SWRCB declare critical tributaries to San Gregorio and Pescadero creeks fully appropriated during summer and fall months.

8.2.5.2 Año Nuevo (Gazos Creek) HSA

SM-AN-01 Implement the projects recommended as high priority for coho salmon in the Gazos Creek watershed restoration plan.

8.2.6 BIG BASIN HYDROLOGIC UNIT

BB-HU-02 Provide education and training on coho salmon-friendly water diversion practices to facilitate compliance with pertinent regulation (e.g., FGC §1600 *et seq*., CFPR 916.9, California Water Code, the Department – NOAA Fisheries guidelines).

BB-HU-03 Encourage funding authorities to allocate adequate resources to prioritize and upgrade culverts to provide coho salmon passage within the range of coho salmon to pass 100-year flows and the expected debris loads (e.g. LWD that might be mobilized).

BB-HU-04 Develop, facilitate, and support by-pass stream-flow requirements on all streams inhabited by coho salmon. Evaluate existing structures and apply to all future structures.

BB-HU-05 Implement the highest priority restoration projects in the watershed plans that address coho salmon habitat. Adjust ongoing efforts based on results.

BB-HU-06 Complete a broad conjunctive-use feasibility study to focus on creative ways to better manage existing surface and groundwater resources in Santa Cruz County, including all cities and water districts, to better utilize groundwater storage and increase baseflow at critical times. This would involve water sources under the control of Scotts Valley Water District, City of Santa Cruz, Soquel Water District, and San Lorenzo Water District.

BB-HU-07 Develop a lagoon management plan that addresses the needs of coho salmon.

8.2.6.1 Davenport HSA

BB-DA-01 Work with the SWRCB to develop and enforce stream flow bypass requirements for diversions from the alluvial reaches of Waddell, mainstem Scott, Big, Mill, and San Vicente creeks.

BB-DA-02 Petition the SWRCB to declare Scott and San Vicente creeks fully appropriated during summer and fall months.

BB-DA-03 Improve the form and function of riparian vegetation in alluvial reaches by implementing established BMPs designed to reduce bank erosion, temperature, and removal of LWD. These BMPs include, but are not limited to, livestock fencing where needed, reclamation or reconstruction of flood plains, and active revegetation. This recommendation applies especially to Scott Creek.

BB-DA-04 Reduce erosion from roads and resulting sedimentation of instream habitat. Implement established BMPs that account for public safety standards, including, but not limited to, assessment procedures and a suite of road reconstruction prescriptions. This recommendation applies especially to Scott Creek.

BB-DA-05 Encourage the DPR to develop a logjam management plan for Waddell Creek. Log jams should be closely examined for coho salmon passage and conservatively modified if absolutely necessary for coho salmon passage.

BB-DA-07 Develop and enforce stream flow bypass requirements for diversions from the alluvial reaches of mainstem San Vicente and Mill creeks.

8.2.6.2 San Lorenzo River HSA

BB-SL-01 Reduce soil erosion and resulting sedimentation of in-stream habitat that is attributable to roads. Implement adopted BMPs, accounting for public safety standards, including, but not limited to, assessment procedures and a suite of road reconstruction prescriptions. This recommendation applies especially to San Lorenzo River.

BB-SL-02 Develop and enforce stream flow bypass requirements for diversions from the alluvial reaches of San Lorenzo River and its tributaries, Zayante, Fall, Bear, Boulder, and Branciforte creeks.

BB-SL-03 Evaluate the Felton Diversion Dam for impacts to coho salmon.

BB-SL-04 Improve adult coho salmon passage at locations named in the San Lorenzo River Enhancement Plan, the Santa Cruz Road Crossing and Salmonid Passage Assessment (Taylor 2003) and other locations identified by the Department as being problematic. Implement the portions of these plans that are consistent with recovery strategy.

8.2.6.3 Aptos-Soquel HSA

BB-AP-01 Implement elements of the Soquel Creek Watershed Assessment and Enhancement Project Plan consistent with the recommendations of recovery strategy. Specifically focus on projects recommended as high-priority in this coho salmon-centric plan. These projects include preservation of base flow, restoration of flood plains, improvements to coho salmon passage, BMPs to reduce sedimentation of instream habitat.

BB-AP-02 Explore and promote opportunities to assure diversion of streamflow (directly or indirectly) is consistent with perpetuation of Soquel Creek coho salmon. Among others, these opportunities include amendments to the adjudication, water conservation, shallow recharge opportunities, shallow-well gauging, deep-well gauging, stream-gauging, self-monitoring of diversions, and conjunctive water management for recovery of groundwater levels.